Name: Date:

Polynomial Factoring solution (version 689)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 44 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(44)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 176}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-32}}{2}$$

$$x = \frac{-12 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{-12 \pm 4\sqrt{2}\, i}{2}$$

$$x = -6 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 + 4i$ and $-3 - 5i$ in standard form $(a + bi)$.**

Solution

$$(9 + 4i) \cdot (-3 - 5i)$$

$$-27 - 45i - 12i - 20i^2$$

$$-27 - 45i - 12i + 20$$

$$-27 + 20 - 45i - 12i$$

$$-7 - 57i$$

Polynomial Factoring solution (version 689)

3. **Write function $f(x) = x^3 + 2x^2 - 21x + 18$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	2	-21	18
3		3	15	-18
	1	5	-6	0

$$f(x) = (x-3)(x^2+5x-6)$$

$$f(x) = (x-3)(x+6)(x-1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)^2 \cdot (x+1)^2 \cdot (x-3)$$

Sketch a graph of polynomial $y = p(x)$.